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**INFORMATION REPORT**

REPORT

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SUBJECT The Central Scientific Research Institute of  
Technology and Engineering (Ts NIIMash) at  
Moscow

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1. The Central Scientific Research Institute of Technology and Engineering (Tsentralnyy Nauchno-Issledovatel'skiy Institut Tekhnologii i Mashinostroeniya - TsNIIMash) is located at No. 2 Sharikopodshipnikovskaya Ulitsa, Moscow, where it occupies a five-story building, with single-story and two-story blocks housing experimental workshops and laboratories in close proximity there to.

Past History and Prewar Activities

2. The institute began its existence in 1931 and was then known as the Central Scientific Research Institute of Engineering and Metal Working (Tsentralnyy Nauchno-Issledovatel'skiy Institut Mashinostroeniya i Metalloobrabotki - TsNIIMash). It was at that time subordinate to the Chief Directorate of Engineering Industry of the People's Commissariat of Heavy Industry.
3. The task of the institute consisted in the study of technological problems of engineering in various branches of industry. Originally the institute had at its disposal nine laboratories and several experimental workshops, the latter being united for administrative purposes into a single experimental factory. Scientific activity was concentrated in sections where the study of various problems of machine building and metal working was carried out under the supervision of professors and engineers.
4. The following are some of the problems studied at that time in the sections and laboratories of the institute:
  - a. Forge Section and Laboratory: Forging machines, hammers, presses. Supervised by Professor A. I. Zimin.

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-2-

- b. Foundry Section and Laboratory: Moulding mixtures, centrifugal casting, etc.
  - c. Power Transmission Section: Hydraulic, electric, and mechanical transmissions.
  - d. Welding Section: All problems of welding. Supervised by Academician Ye. O. Paton and Engineer Kuzmak, now a professor and Doctor of Technical Science.
5. The institute's activities gradually expanded and became less theoretical. New sections and laboratories came into existence, as well as scientific sectors (sektor). Some sections and laboratories ceased to exist because of the opening of new scientific research institutes. Thus, for instance, the Textile Engineering Section and Laboratory directed by Professor S. O. Dobrogurskiy ceased to exist on the creation of the Scientific Research Institute of Textile Engineering. Similarly, the Food Processing Machines Section and Laboratory ended their existence on the creation of an appropriate scientific research institute. The same applies to the Ball Bearing Laboratory and others.
  6. Before the war TsNIIIMash was not engaged in any way in the study and design of machines for the metallurgical industry. Activities in this field only began after the war.
  7. Before the war personnel numbered about 1,000, including about 200 scientific workers and engineers. The number of laboratories was about 30.

#### Activities of TsNIIIMash During the War

8. When war broke out, and when in the autumn of 1941 the German army approached Moscow, TsNIIIMash was not evacuated. It was the only scientific institution to remain in Moscow at that critical time. Many new factories in and near Moscow, which had sprung up on the sites of evacuated factories and were producing military equipment, arms, and munitions of all kinds, continually applied to the institute for technical aid.
9. During this period the institute's activities became quite different from those carried out in peace time. All personnel worked in the laboratories and workshops to minister to the needs of the front line. Investigations and experiments were carried out in the creation of a new technique in the production of munitions, various military machines, tanks, guns, etc, and in finding substitutes for strategic materials and economizing in scarce raw materials.

#### Foundry Department

10. The Foundry Department, together with its workshop and laboratory, worked continuously in studying these problems. For mastering the technique of producing munitions by means of a new method of chill casting in metallic moulds, Stalin Prizes were awarded in 1942 to engineers F. N. Syzrankin, head of the foundry workshop; N. A. Sokolov; and N. A. Shamin, Chief Metallurgist of the People's Commissariat of Heavy Industry, who supervised the work. This method was immediately introduced into munition factories and played a not unimportant part during this period of the war. Factories producing mines were able to increase their output by at least four times and at the same time to reduce the number of operatives.
11. The introduction of various new methods of chill casting did not proceed

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-3-

smoothly. Engineers and technicians of TsNIITMash were very often obliged to visit factories to point out mistakes and to exercise general supervision until production ran smoothly.

12. Work connected with the casting of form tools from high-speed and other steels was carried out under the supervision of Professor T. A. Lebedev, Doctor of Technical Science and Deputy Director of TsNIITMash for Scientific Affairs.
13. Many problems of practical significance to industry, such as the re-smelting of filings in cupola furnaces and the desulphurization of pig iron in ladles, were worked out under the supervision of Professor P. P. Berg.
14. Problems of centrifugal casting were worked out under the supervision of S. E. Rozenfeld. Simply constructed machines of console type, with a horizontal axis of rotation, were produced for centrifugal casting of objects having a maximum external diameter of 350 mm and a length of 400 mm. The casting of drills with an afterchange of nitrogen by this method was worked out by Professor Prosvirin.

#### Welding Department

15. The Welding Department of TsNIITMash, of which Engineer K. A. Udotov is the head, fulfilled complicated, important tasks. New electrodes and fluxes for automatic electric arc welding were evolved under the direction of the eminent specialists A. A. Alov and K. V. Lyubavskiy. Automatic welders of several types for electric arc welding under a layer of flux were designed by B. I. Brinberg and other engineers. These welders accelerated the speed of welding by many times and at the same time decreased the need for electricity and manpower. A. S. Gelman carried out research in the field of spot welding and its practical application.

#### Department of Pressure Treatment of Metal

16. Much work was done in the department and laboratories of pressure treatment of metal to create new technological methods of making articles for war needs. Thus, in 1942 and the beginning of 1943, several thousand dies were designed under the supervision of engineer V. A. Nevskiy, a specialist in drop forging. These greatly increased the output of parts for tanks and other military machines.

#### Department of Durability

17. In the Department of Durability and in several laboratories, under the supervision of the eminent specialist Professor A. P. Gulyyev and others, important work was done in the testing of metals for durability and in the heat treatment of tool steel and other steels.
18. Under the supervision of I. V. Kudryavtsev the simplest machines were evolved for testing hardness, compressive strength, tensile strength, and resistance to shearing. These machines were installed in numerous factory laboratories for testing metals, type PB 750 and PB 750a machines, up to 750 kg; type PB 3 machine, up to 3,000 kg; type IM-4 and IM-4A Universal machines, up to 4,000 kg.

#### Furnace Department

19. In the Furnace Department, under the supervision of V. G. Bosomolov (sic) and others, problems of decreasing the consumption of coke in cupola furnaces, finding coke substitutes, introducing a method of blasting, etc, were worked out.

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-4-

20. In the beginning of 1942 methods were worked out for converting continuous furnaces from liquid to solid fuel; up to that time continuous furnaces had worked only on liquid fuel. These methods were successfully applied to several metallurgical factories.

#### Central Bureau of Reduction Gear Construction

21. The Central Bureau of Reduction Gear Construction designed a precision gear-cutting tool for cutting gears on tank wheels; B. A. Taits, M. S. Polotskiy, L. A. Arkhangelskiy and I. R. Lekhtsyer were concerned with this work.
22. Manuals dealing with gear transmission and their control were published under the editorship of Professor N. A. Kalashnikov and B. A. Taits.
23. Engineer A. I. Petrusevich carried out tests of steel gear wheels which had been processed in different ways, cemented, nitrided, hardened throughout, etc.

#### Central Bureau of Case Hardening

24. The Central Bureau of Case Hardening, directed by Professor V. I. Prosvirin and Yu. M. Bogatyrev, chief engineer of the Bureau, designed several of the first Soviet high-frequency generators which worked successfully in hardening articles in tank factories.
25. Engineer I. Sh. Svet, aided by V. V. Aleksandrov and V. G. Galkina, worked out a method of hardening crankshafts by means of high-frequency current.

#### Thermic Laboratory

26. New methods of heat treatment of various articles were evolved in the Thermic Laboratory under the supervision of Professor Minkevich and Ilinskiy. Among them was a new method of processing mortars and other military objects, evolved by I. F. Zudin. This method was adopted by numerous factories producing mortar armament.

#### Other Problems

27. Many other problems were successfully tackled by TsNIITMash during the war. Following are some of them:
- a. Substitutes for oil used when hardening in a steam jet.
  - b. Production of munitions from tube waste.
  - c. Friction and lubrication. Cast iron bearings of segmented type were designed, and other economics of scarce materials were effected by A. I. Petrusevich, D. G. Polyakov, and A. M. Ertel.
  - d. Gas generators for firewood were designed by Yu. N. Griboyedov.
  - e. Mobile cupola furnaces with a productive capacity of 250 kg per hour were designed by L. I. Serebryer and A. M. Shternberg.
  - f. Compilation of standards. The Standardization Bureau worked out official All-Union State Standards.
28. The activities of TsNIITMash were extremely diverse in character, and this was a serious defect. Owing to the very large number of problems studied,

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-5-

much research work could not be completed or could not be carried out with the forces available to the institute.

Present Organization of TsNIITMash

29. At the present time the institute has to some extent altered its organization. The change took place during and after the war. Scientific sectors and sections were replaced by departments and bureaus. Following is a list of some of these departments and bureaus:
- a. Department of Pressure Treatment of Metal
  - b. Department of Durability
  - c. Department of Cold Treatment of Metal
  - d. Department of Instrument Construction
  - e. Foundry Department
  - f. Forge and Stamping Department
  - g. Welding Department
  - h. Engineering Department (otherwise known as the Department of Machines and Mechanisms)
  - i. Materials Testing Department
  - j. Department for the Exchange of Information (Obmen Opytom)
  - k. Department for Training Scientific Personnel
  - l. Central Designing Bureau of Metallurgical Engineering
  - m. Central Bureau of Electrical Case Hardening
  - n. Standardization Bureau
30. The number of laboratories has increased considerably and has at present reached 51. Most of the laboratories are well equipped with special appliances and machines of native and foreign make. Following is a list of the laboratories:
- a. Laboratory of Durability
  - b. Laboratory of Mechanical Tests
  - c. Laboratory of Fatigue Endurance
  - d. Laboratory of Corrosions
  - e. Materials Testing Laboratory
  - f. X-ray Laboratory
  - g. Laboratory for the Investigation of Physical Properties of Alloys
  - h. Laboratory for Optical Methods of Investigation of Stresses
  - i. Laboratory of Metal Creep

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-6-

- j. Laboratory of Surface Properties
- k. Laboratory of the Central Bureau of Electrical Case Hardening
- l. Second Laboratory of the Central Bureau of Electrical Case Hardening. In this and the preceding (k) laboratories experiments are carried out in electrical contact hardening, induction case hardening with high frequency currents, and hardening by electrolysis.
- m. Laboratory of the Bureau of Case Hardening.
- n. Second Laboratory of the Bureau of Case Hardening
- o. Third Laboratory of the Bureau of Case Hardening. In the three laboratories of the Bureau of Case Hardening, experiments are carried out in case hardening with a solid carbonizer and with a gas carbonizer, nitrogen case hardening, cyanide hardening, and other methods of case hardening with chromium, aluminum, silica, boron, molybdenum, vanadium, tungsten, etc.
- p. Foundry Laboratory
- q. Laboratory of Centrifugal Casting
- r. Laboratory of Moulding Materials
- s. Laboratory of Casting under Pressure and Precision Casting
- t. Forging Laboratory
- u. Stamping Laboratory
- v. Furnaces Laboratory
- w. Laboratory of Machine Components
- x. Laboratory of Automatics
- y. Rolled Metal Laboratory
- z. Laboratory of Automatics of Metallurgical Machines
- aa. Laboratory of the Technology of Rolling
- bb. Laboratory of Instrument Construction
- cc. Laboratory of Electric Arc Welding
- dd. Laboratory of Electric Contact Welding (Resistance Welding)
- ee. Laboratory of Welding (all other forms of welding)
- ff. Laboratory of Transmissions
- gg. Laboratory of Cold Treatment of Metals
- hh. Magnetic Laboratory
- ii. Metal-ceramic (Metallokeramicheskaya) Laboratory
- jj. Thermic Laboratory
- kk. Galvanic Laboratory

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-7-

- ll. Metallographic Laboratory
- mm. Experimental Laboratory
- nn. Mechanical Laboratory
- oo. Chemical Laboratory
- pp. Laboratory of the Central Bureau of Reduction Gear Construction
- qq. Second Laboratory of the Central Bureau of Reduction Gear Construction
- rr. Laboratory of Friction and Lubrication
- ss. Electric Laboratory
- tt. Laboratory of Fluxes
- uu. Laboratory of Luminescent Detection of Defects
- vv. Laboratory of Ultra-acoustic Detection of Defects

Personnel

31. Until recently the director of TsNIITMash was Professor I. A. Oding, Corresponding Member of the Academy of Sciences of the USSR, an eminent specialist in metallography. He is the author of many treatises in this field, including Kinetic Theory of the Mechanism of Relaxation and Creep and other treatises dealing with fatigue endurance of metals, the study of internal stresses, etc. Oding took a close part in the activities of the Department of Durability. His position was shaken in the middle of 1950 when he severely criticized in one of his articles A. A. Ilyushin's views on the durability of metals. He made use of expressions which could be obliquely construed as symptoms of political unreliability. His article created a great stir, and Oding was obliged to write another one in which he acknowledged that he had "admitted into my previous article formulations erroneous in principle", abused [ ] scientific methods 50X1-HUM "the character of which was due to their rotten anti-materialistic ideology", and so on.
32. At the present time the director of the institute is Ye. P. Unksov, Candidate of Tech. Science, a specialist in the pressure treatment of metal, who has made a close study of [ ] stamping methods. Previous to his 50X1-HUM appointment he worked in the Department of Pressure Treatment of Metals. There he studied problems of structural alterations occurring in steel during pressure treatment and worked out the technique of producing turbine vanes by stamping, as well as other problems.
33. The assistant director for scientific affairs is Professor V. I. Prosvirin, Doctor of Tech. Science, a specialist in metallography. One of his specialties is the study of the effect of nitrogen on steel. He took a close part in the issue of a handbook on structural steel.
34. At the present time TsNIITMash has a total personnel of about 2,000, including about 300 scientific workers and engineers. Following is an incomplete list of the latter:

Abramova, Ye. V., engineer  
 Agasyan, O. N., Candidate of Tech. Sc.  
 Ageyev, Professor, Dr. of Tech. Sc. (now at the Academy of Sciences of the USSR)  
 Akulov, N. S., engineer  
 Aleksandrov, G. I., engineer  
 Aleksandrov, V. V., engineer  
 Alfeyev, N. V., engineer  
 Alov, A. A., professor, Doctor of Tech. Sc.

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-8-

Alshevskiy, L.Ye., engineer  
 Alshits, I.Ya., engineer  
 Andreyev, V.M., professor (during war and up to 1946)  
 Antonov, P.A., engineer  
 Arkhangelskiy, L.A., engineer  
 Astafev, S.S., engineer

Balandin, N.N., engineer, Stalin Prize Winner  
 Balshin, M.Yu., engineer  
 Barinovskiy, V.M., engineer  
 Bartashev, A.V., engineer  
 Bassantsev, P.K., engineer  
 Batagov, B.N., Cand. of Tech. Sc.

Bekker, I.E., engineer  
 Belousov, N.N., engineer  
 Belova, A.P., engineer  
 Berezhinskiy, M.B., engineer  
 Bereznyuk, V.A., engineer  
 Berg, P.P., professor, Dr. of Tech. Sc.  
 Berliner, L.I., engineer  
 Bibilashvili, K.O., engineer  
 Bidman, L.O., engineer  
 Bogatyrev, Yu.M., engineer  
 Bogomolov, L.P., Cand. of Tech. Sc.  
 Bogorad, A.N., engineer  
 Bolotin, Kh.L., engineer  
 Brinberg, I.L., Cand. of Tech. Sc., Stalin Prize Winner  
 Butuzov, S.S., engineer

Chaika, V.Kh., engineer  
 Chapayev, N.P., engineer  
 Chechnev, K.L., engineer  
 Chekanov, A.A., engineer  
 Cherepukova, Ye.Ye., Cand. of Tech. Sc.  
 Chernushevich, U.A., engineer, Stalin Prize Winner  
 Chernyak, B.Z., engineer, Cand. of Tech. Sc.  
 Chuloshikov, M.I., engineer, Stalin Prize Winner

Diker, Ya. I., engineer  
 Dmitriyev, L.D., engineer, Stalin Prize Winner  
 Dolzhanskiy, A.I., engineer  
 Dubrova, A.P., engineer  
 Dubrovskiy, A.M., engineer  
 Dvinyaninov, S.A., engineer

Erenburg, E.E., engineer  
 Ertel, A.M., engineer (now at Institute of Machines of Ac. of Sciences)

Feferboim, G.I., engineer  
 Feigelson, B.F., engineer  
 Fishbein, E.I., engineer  
 Freiman, L.S., professor, Dr. of Tech. Sc.  
 Fundator, V.I., engineer  
 Futoryan, S.B., Cand. of Tech. Sc.

Gimpelson, A.I., engineer  
 Girsh, I.I., Cand. of Tech. Sc.  
 Glukharev, V.P., engineer  
 Gorozhankin, A.N., engineer  
 Grach, L.E., engineer  
 Grzhibovskiy, S.S., engineer

Ilinskiy, S.K., professor, Dr. of Tech. Sc.  
 Iroshnikov, A.N., Cand. of Tech. Sc.  
 Isayev, A.I., Cand. of Tech. Sc.  
 Ivanov, Ye.A., Cand. of Tech. Sc.  
 Ivanov, V.K., Cand. of Phys-Math. Sc.

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-9-

Kalashnikov, N.A., professor, Dr. of Tech. Sc. (During war)  
 Kalmykov, I.M., engineer  
 Kanevskaya, T.B., Cand. of Tech. Sc.  
 Katsinskiy, N.P., engineer  
 Katsnelson, V.Yu., engineer  
 Ketov, Kh.F., professor, Dr. of Tech. Sc. (During war). Subsequently at Leningrad Polytechnic Institute. Died at the end of 1948.  
 Khait, D.M., Cand. of Tech. Sc.  
 Kheifets, S.G., Cand. of Tech. Sc.  
 Khrobastov, M.F., engineer, Stalin Prize Winner  
 Kistyan, A.G., engineer, Cand. of Tech. Sc.  
 Klementov, V.I., engineer  
 Klopov, I.F., engineer  
 Kobrin, N.M., engineer  
 Kogos, A.M., engineer, Stalin Prize Winner  
 Komarova, K.N., engineer  
 Komissarov, S.N., engineer  
 Kopytov, V.F., Cand. of Tech. Sc.  
 Kopytova, G.F., engineer  
 Korolev, A.A., Cand. of Tech. Sc., Stalin Prize Winner  
 Krauze, G.N., engineer  
 Kruglikov, A.V., engineer, Stalin Prize Winner  
 Kryanin, I.R., Cand. of Tech. Sc.  
 Kudryavtsev, I.V., Cand. of Tech. Sc., Stalin Prize Winner  
 Kumanin, I.B., engineer  
 Kunitskiy, N.P., Cand. of Tech. Sc.  
 Kunyavskiy, M.N., Cand. of Tech. Sc.  
 Kuroyedov, A.V., Cand. of Tech. Sc.  
 Kuzmak, E.M., professor, Dr. of Tech. Sc. (Prior to 1946)  
 Kuzmin, A.D., engineer, Stalin Prize Winner  
 Kuznetsov, A.V., engineer  
 Lapidus, V.A., Cand. of Tech. Sc.  
 Lapin, N.A., Cand. of Tech. Sc.  
 Lazarev, B.I., Engineer  
 Lebedev, T.A., professor, Dr. of Tech. Sc.  
 Lekhtsiyer, I.R., engineer  
 Levin, G.I., engineer  
 Levin, M.M., engineer  
 Lifshits, S.S., Cand. of Tech. Sc.  
 Lipkes, V.Ya., Cand. of Tech. Sc.  
 Lipman, M.S., Cand. of Tech. Sc.  
 Lyass, A.M., Cand. of Tech. Sc.  
 Lyubotov, V.F., engineer  
 Lyubavskiy, K.V., professor, Dr. of Tech. Sc., Stalin Prize Winner  
  
 Martynov, V.N., engineer  
 Maslov, E.N., Cand. of Tech. Sc.  
 Mikheyev, V.M., engineer  
 Milman, B.S., engineer  
 Minkevich, N.A., professor, Dr. of Tech. Sc. (Also at Moscow Steel Institute imeni Stalin)  
 Mironov, K.A., engineer  
  
 Nesmeyanova, K.A., engineer  
 Nevskiy, V.A., engineer  
 Nosal, V.V., engineer, Stalin Prize Winner  
 Novikov, V.M., engineer  
  
 Oding, I.A., professor, Corresp. Member of Acad. of Science, Stalin Prize Winner  
 Orlov, V.V., engineer  
 Ovchinnikov, A.S., engineer

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- 10 -

Pashukanis, F.I., engineer  
 Petrusevich, A.I., engineer (Now at the Institute Machine Management of Acad. of Sciences).

Plavskiy, U.I., engineer  
 Pokrovski, K.L., engineer  
 Polotski, M.S., engineer  
 Polyakov, D.G., engineer  
 Polyakov, U.S., Cand. of Tech. Sc.  
 Pongilskiy, N.F., engineer  
 Poplavskiy, I.A., engineer  
 Pronin, B.A., engineer  
 Prosvirin, V.I., professor, Dr. of Tech. Sc.  
 Prozorov, L.V., Cand. of Tech. Sc.  
 Prudnikov, N.F., engineer

Ragulina, A.V., engineer  
 Revin, I.A., engineer  
 Rokotyan, Ye.S., Cand. of Tech. Sc., Stalin Prize Winner  
 Ronin, L.M., engineer  
 Rozenfeld, S.E., Cand. of Tech. Sc.  
 Ruskevich, M.L., engineer  
 Ryabchenkov, A.V., Cand. of Tech. Sc.  
 Rybalchenko, A.M., engineer  
 Rybalka, P.G., engineer, Stalin Prize Winner

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Saburov, M.Z., engineer  
 Saverin, M.A., professor, Dr. of Tech. Sc., Merited Worker of Science and Technics

Saverin, M.M., Cand. of Tech. Sc.  
 Serebriyer, L.I., engineer  
 Sergeyev, S.M., engineer  
 Shalnev, V.G., engineer  
 Shamir, N.A., engineer, Stalin Prize Winner (during war; subsequently Chief Metallurgist of the Ministry of Heavy Engineering)

Shcheglov, V.F., Cand. of Tech. Sc.  
 Shinkin, M.M., engineer  
 Shleier, E.V., docent, Cand. of Tech. Sc. (during war)  
 Shofman, L.A., Cand. of Tech. Sc.  
 Shor, E.R., engineer (at present working in All-Union Institute of Aircraft Materials, VIAM)

Shteinberg, A.M., engineer  
 Shvayun, V.L., engineer  
 Sigolayev, S.Ye., engineer  
 Skrabelinskiy, N.V., engineer  
 Slepak, Ye.Sh., engineer  
 Smelov, M.A., engineer  
 Smolyakov, A.N., engineer  
 Sobol, V.F., engineer  
 Sokolov, N.A., engineer, Stalin Prize Winner  
 Sokolov, V.N., Cand. of Tech. Sc.  
 Sokolskaya, L.I., engineer  
 Sorokin, P.V., engineer  
 Speranskiy, B.A., engineer  
 Storozhev, M.N., Cand. of Tech. Sc.  
 Svet, I.Sh., engineer (Was a long time on detachment at Kharkov Tractor Factory)  
 Svetozarov, V.A., engineer  
 Syzrankin, F.N., engineer, Stalin Prize Winner

Taiger, Sh. S., engineer  
 Taits, B.A., docent, Cand. of Tech. Sc.

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-11-

Talanov, P.I., engineer, Stalin Prize Winner  
 Tashlitskiy, N.I., engineer  
 Tebenkov, B.P., engineer  
 Tokarskiy, A.P., engineer  
 Trubin, G.K., Cand. of Tech. Sc.  
 Tselikov, A.I., professor, Dr. of Tech. Sc., Stalin Prize Winner (twice)  
 Tsitrin, D.N., Cand. of Tech. Sc.  
 Turlygin, S.Ya., professor

Udotov, K.A., engineer, Stalin Prize Winner  
 Unksov, Ye.P., Cand. of Tech. Sc.

Vaganov, S.Yu., Cand. of Tech. Sc.  
 Vagin, B.Ye., engineer  
 Vashurova, T.A., engineer  
 Varshinskaya, A.D., engineer  
 Vidman, D.I., engineer  
 Vinogradov, I.Ye., engineer  
 Vinogradov, S.V., engineer  
 Voronov, I.F., engineer  
 Vyugova, G.Ya., Cand. of Tech. Sc.

Yakhnina, V.D., engineer  
 Yakovlev, V.K., engineer  
 Yakushkin, V.P., Stalin Prize Winner  
 Yarovinskiy, L.M., engineer, Stalin Prize Winner  
 Yatskevich, S.I., engineer  
 Yeremin, N.I., Cand. of Physico-Mathem. Sc.  
 Yerokhin, A.A., Cand. of Tech. Sc. (In 1947 went over to the Sc. Res. Institute of Aero-Technology-NIITAT)

Yudin, S.B., Cand. of Tech. Sc.

Zaks, L.M., engineer  
 Zayets, I.L., engineer  
 Zhavoronkov, N.A., engineer  
 Zhilin, N.A., engineer  
 Zhilina, Ye.N., engineer  
 Zorev, N.N., Cand. of Tech. Sc.  
 Zotov, N.P., engineer  
 Zudin, I.F., engineer

#### Method of Recruiting Scientific Personnel of TsNIITMash

35. TsNIITMash, in common with other scientific institutes, between 1 May and 1 September or 15 October accepts for postgraduate study (aspirantura) engineers who have qualified in higher educational establishments with distinction and have shown an aptitude for scientific work. Also accepted are experienced engineers who have worked in factories but are not older than 40 years of age. To be accepted for postgraduate study engineers have to pass a competitive examination in one special subject chosen by the competitor, e.g., metallography, founding, forging and stamping, cold treatment of metals, and machine-building, in one foreign language, and in politics. Successful competitors commence working as postgraduate students in the departments, bureaus, and laboratories of TsNIITMash, under the supervision of senior scientific workers. Students who show ability are permitted to defend dissertations for the degree of Candidate of Technical Science. Students who fail to show ability for scientific work are detached and sent to various factories in accordance with their specialties. The time limit for the defense of dissertations is three years. The Department of Personnel Training of TsNIITMash is in charge of the reception of students for postgraduate study.

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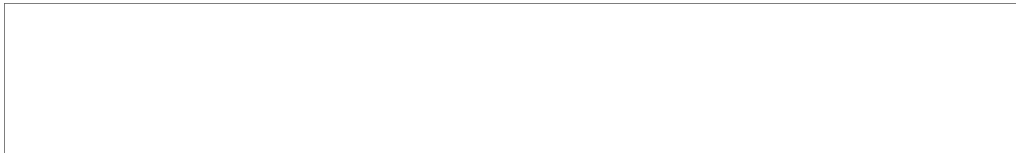
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36. There are correspondence courses for postgraduate study but only in three specialties, viz., metallurgical machines of rolling mills, cold treatment of metals, and welding. The time limit for the defense of dissertations by correspondence course students is four years, after which time the unsuccessful student is expelled.



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